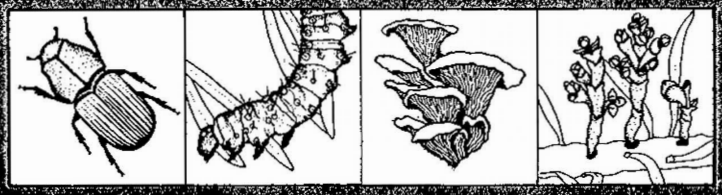
Forest Insect & Disease Management



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EVALUATION OF DWARF MISTLETOE CONTROL SULA RANGER DISTRICT BITTERROOT NATIONAL FOREST

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SUMMARY

Residual Douglas-fir left after harvesting are dwarf mistletoe-infected and pose a threat to regeneration. Felling of residuals, coupled with planned slash disposal and thinning, will effectively reduce dwarf mistletoe intensity and increase future volume yields. The benefit/cost ratio based on timber values only, for the current rotation, is 0.041/1 at 10 percent and 1.793/1 at 6 percent. Elimination of dwarf mistletoe infection for several rotations will increase the benefit/cost ratio. Value added to the economy cannot be used in benefit/cost analysis, but will be a substantial sum. Control is recommended.

INTRODUCTION

The Sula Ranger District has proposed the removal of dwarf mistletoe-infected Douglas-fir residuals from 357 acres to protect both advanced regeneration and new Douglas-fir plantings to be made over the next 2 years. Slash disposal and concurrent precommercial thinning will be funded with fuels management and P&M dollars. The District also proposes to conduct presuppression surveys on 300 acres with FIDM funds. We evaluated several of the stands on October 24, 1979, and discussed management alternatives with District personnel.

United States Department of Agriculture | Forest Service | Northern Region | State & Private Forestry | P.O. Box 7669 Missoula, Montana 59807

TECHNICAL INFORMATION

Causal agent.--Douglas-fir dwarf mistletoe, Arceuthobium douglasii Engelm.

Host.--Douglas-fir, Pseudotsuga menziesii (Mirb.) Franco.

Type of damage.--Reduction of tree vigor, reduction of height and diameter growth, and some mortality. We estimate the average volume loss in Douglas-fir type due to A. douglasii to be 20 cubic feet per acre per year.

AREA DESCRIPTION

Proposed control areas are in the West Fork Camp Creek, Andrew-Praine Creek, and Medicine Tree areas (figure 1).

Stands were logged 7 to 20 years ago, leaving some nonmerchantable large trees and clumps of overstocked regeneration interspersed with nonstocked areas. Mistletoe infection varies from heavy to light to none in the Douglas-fir. Scattered lodgepole pine are mistletoe-infected, but mistletoe does not pose much of a threat to the lodgepole pine. Ponderosa pine, subalpine fir, and Engelmann spruce are present, but they are not affected by mistletoe. Some of the larger residuals are now merchantable; they will be logged prior to felling mistletoe-infected trees or precommercial thinning.

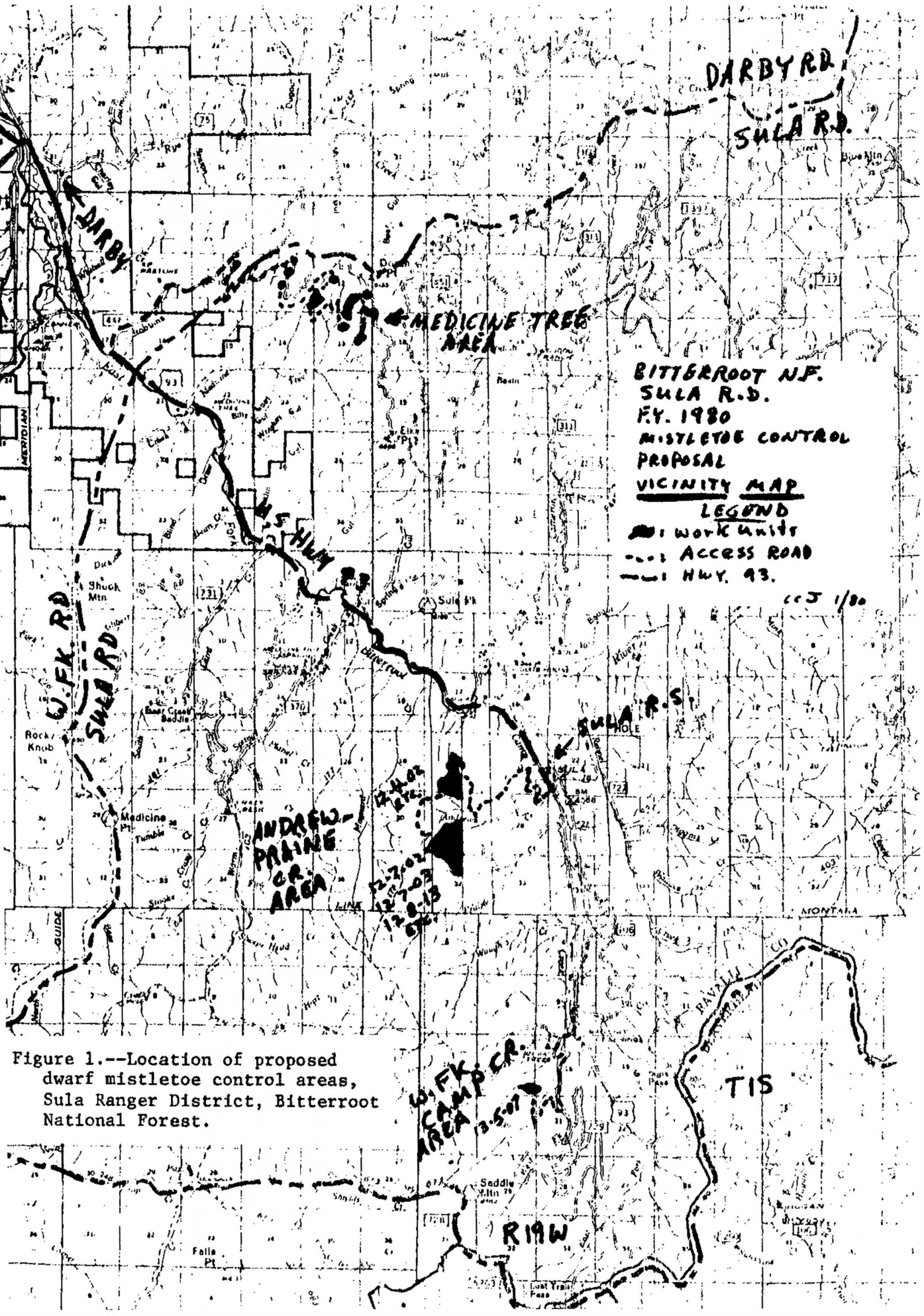

Figure 1.--Location of proposed dwarf mistletoe control areas, Sula Ranger District, Bitterroot National Forest.

MANAGEMENT ALTERNATIVES

These alternatives have been identified:

1. Defer Treatment. A larger number of the residuals will become merchantable. Dwarf mistletoe will continue to intensify in the understory to the point where stand destruction will be the only option.

2. Fall Infected Residuals, Precommercially Sanitize the Understory, and Preplant Unstocked Areas. The treatment will result in a fully stocked, young stand with economically unimportant dwarf mistletoe infestation.

PREFERRED ALTERNATIVE

Proposed treatment includes partial to complete felling of infected trees, slash disposal by lopping and/or burning, precommercial sanitation/thinning, and spot planting. Stands, treatments, costs, and source of funding are shown in table 1.

FIDM targets are:

Presuppression survey	300 acres
Suppression, silvicultural	357 acres
Volume removed	178 MBF
Volume protected	7.1 MMBF

DISCUSSION

Douglas-fir dwarf mistletoe is responsible for the most serious disease loss on the Bitterroot National Forest. Average volume loss in the Douglas-fir type on the Forest is estimated to be 20 cubic feet per acre per year. Infected trees and stands are also more vulnerable to attack by other disease organisms and insects.

Other funds for mistletoe control, such as KV, are not available because the areas were logged 7 to 20 years ago. FIDM funds will be used for felling mistletoe-infected residuals and other funds (P&M and fuels management) will pay for slash disposal and precommercial thinning.

Table 1.--Stands, treatments, costs, and source of funds for proposed dwarf mistletoe control areas, Sula Ranger District, Bitterroot NF

(ADD SO,CA,25%)

STAND	ACRES	PROPOSED TREATMENT	ESTIMATED COST TOTAL	REQUESTED FUNDING	FY
W. Fk Camp					
13-5-07	12	Mistletoe Felling-Partial	$480	FIDC	1980
	12	Jackpot Burn	$200	Fuels MGT.	1981
Andrew-Praine					
12-4-02	75	Mistletoe felling-Partial	$3000	FIDC	1980
(12-4-01)	48	Lopping Slash	$ 960	Fuels Mgt.	
(12-4-16)				or 034(PM)	1980
	14	Dozer Piling Slash	$1120	033 w/scarify	
	11	Jackpot Burning	$ 200	Fuels Mgt.	1981
	2	Hand Piling Slash	$ 350	Fuels Mgt.	1981
	10	Precommercial Thin	$1000	034 (PM)	1980
	17	Mistletoe Felling-Complete	$1700	FIDC	1980
	17	Prescribed Burn	$1360	Fuels Mgt.	1981
Andrew-Praine					
12-7-02	136	Mistletoe Felling-Partial	$5440	FIDC	1980
12-7-03	50	Lopping Slash	$1000	034 PM	
12-8-13				Fuels Mgt	1980
(12-8-14)	23	Dozer Piling Slash	$1840	033 (PM)	
				w/scarity	1981
	57	Jackpot Burning	$ 500	Fuels Mgt	1981
	6	Hand Piling Slash	$ 960	" "	1981
	16	Precommercial Thin	$1600	034 (PM)	1980
	10	Mistletoe Felling-Complete	$1000	FIDC	1980
	10	Prescribed Burn	$ 800	Fuels Mgt.	1981
Medicine Tree					
06-1-05	93	Mistletoe Felling-Partial	$3720	FIDC	1980
06-3-12	35	Lopping Slash	$1400	034 or	
06-3-04				Fuels Mgt	1980
06-4-05	58	Jackpot Burning	$ 464	Fuels Mgt	1981
06-4-07	14	Mistletoe Felling-Complete	$1120	FIDC	1980
06-4-10					
06-4-13	14	Prescribe Burning	$1120	Fuels Mgt	1981
	300	Surveys	$1350	FIDC	1980

BENEFIT/COST ANALYSIS

Yield projections on the Forest for two commercial thinnings and a harvest cut show the following volumes:

Cutting age	Volume recovery (MBF)	Value per MBF[1/]	Recovery value
80	2	$127	$254
100	2	127	254
120	16	127	2,032
Totals	20		$2,540

1/ From recent sale on Sula RD, 1980 values, species weighted.

These values assume that stumpage values will remain constant for 80, 100, and 120 years. A more realistic analysis should include a forecast of increased stumpage value for these periods or use lower discount rates. We project that stumpage values will increase at a compound interest rate of 3 percent (much below the inflation rate) over the rest of the rotation. Values would then be:

Cutting age	Volume recovery (MBF)	Current value	Compound factor[2/]	Projected value	Recovery value
80	2	$127	10.6409	$1,351	$2,702
100	2	127	19.2186	2,441	4,882
120	16	127	34.7110	4,408	70,528
Totals	20				$78,112

2/ Value of $1 at n years.

Costs of treatment per acre are:

Felling infected trees	$57.63
Slash disposal	29.81
Precommercial thinning	8.00
Total	$95.44

By dividing the pnw of the benefits by the treatment cost, the benefit/cost ratio at 10 percent is 0.025/1, and at 6 percent is only 1.082/1. If costs of slash disposal and thinning are not used in the benefit/cost analysis, the ratios are 0.041/1 at 10 percent and 1.793/1 at 6 percent.

A 10 percent discount rate is not feasible for calculating benefit/cost ratios for dwarf mistletoe control. Even 6 percent is not feasible unless we assume that stumpage values will increase at a compound interest rate of 3 percent.

There will be value added to the economy from the additional volume recovery possible from mistletoe control. Each MMBF of timber cut creates 7 person-years of employment paying an average of $14,300 per year. Control activities will generate 0.02, 0.02, and 0.16 years of employment in 80, 100, and 120 years respectively, and add $2,860 per acre to the economy.

Another benefit not directly related to pnw in dollars is the reduction of mistletoe infection for several rotations.

RECOMMENDATIONS

Decision for control.--Dwarf mistletoe control is biologically sound, is the preferred alternative, and should be done. Although the benefit/cost ratio is negative at 10 percent, it is positive at 6 percent if we assume an increase in stumpage values in the future. Control will also result in value added to the economy.

Control method.--Removal of dwarf mistletoe-infected residual Douglas-fir from previously cutover stands is the method selected for control.

Impact of control on other resources.--Because mistletoe control will be by felling of scattered, patchy, cull trees from areas already clearcut, there will be no additional adverse impact on other resources. Neither the Sula RD nor we feel the action is controversial enough to need an environmental analysis.